REMARKS

Claims 1, 3-9, and 11-13 were pending. Claims 1, 3-7, 11 and 13 have been amended. Claims 15-18 have been added. Claims 1, 3-9, and 11-13, and 15-18 are pending.

The specification has been amended to correct a typographical error in Equation 4 on page 11.

Claims 1, 3-9, and 11-13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pat. No. 6,320,668 to Kim in view of Japanese patent publication No. 02-074367 to Yamaguchi (translation). These rejections are traversed.

Claim 1 recites a color correction method including "obtaining reference outputs from an image sensor using a color image array, said reference outputs being indicative of outputs for a plurality of known reference colors, said plurality of known reference colors including gray scale elements, at least three primary colors, and at least two other non-primary colors," and "determining an error measure for each of said plurality of known reference colors, said error measure representing a difference between said reference outputs and what would be expected for each of said reference outputs." The method also includes "obtaining a color correction matrix which is adjusted to minimize said respective error measure for each of said plurality of known reference colors," and "using said color correction matrix to optimize color correction for each of said plurality of known reference colors to obtain a color-corrected image from an input image."

The reference to Kim teaches a color correction method in which gray level (achromatic) correction is performed separately from color (chromatic) correction. Gray level data is collected using a densitometer, and is stored in a database separate from that for the color correction matrix data. The Kim reference does not teach or suggest a color correction method in which obtained reference outputs are "indicative of outputs for a plurality of known reference colors, said plurality of known reference colors *including gray scale*," and "obtaining a color correction matrix which is adjusted to minimize said respective error measure for each of said plurality of known reference colors." Claim 1 and its dependent claims 3-5 and 15-16 are submitted as patentable over the cited reference to Kim.

Yamaguchi does not cure the deficiencies of Kim. Yamaguchi has been cited as teaching that it is well known to weigh some colors more than others. The Yamaguchi reference does not teach or suggest a color correction method in which obtained reference outputs are "indicative of outputs for a plurality of known reference colors, said plurality of known reference colors *including gray scale*," and "obtaining a color correction matrix which is adjusted to minimize said respective error measure for each of said plurality of known reference colors." Claim 1 and its dependent claims 3-5 and 15-16 are submitted as patentable over the proposed combination of the references to Kim and Yamaguchi.

Claim 6 recites an image sensor apparatus including an image sensor device "operating using a color filter array which provides color filtering such that colors transmitted to each pixel are measured to determine all color components that actually impinge on an area of said pixel." The apparatus also includes an image processor "operating according to a color correction matrix adjusted to minimize respective error measures, each said error measure representing a difference between a reference output for a known reference color from a color image array and what would be expected for said reference output." The color correction matrix is adjusted "according to at least three primary colors, gray scale elements, and at least two additional non-primary colors."

The reference to Kim teaches an image sensor apparatus in which gray level (achromatic) correction is performed separately from color (chromatic) correction. Gray level data is collected using a densitometer, and is stored in a separate database for achromatic data. The Kim reference does not teach or suggest an image processor "operating according to a color correction matrix adjusted to minimize respective error measures, each said error measure representing a difference between a reference output for a known reference color from a color image array and what would be expected for said reference output," ***and*** the color correction matrix is adjusted "according to at least three primary colors, gray scale elements, and at least two additional non-primary colors." Claim 6 and its dependent claims 7-9, 11-12, and 17-18 are not obvious over the cited reference to Kim, so the Examiner proposes to combine the Kim and Yamaguchi references.

The reference to Yamaguchi does not cure the deficiencies of the reference to Kim. The Yamaguchi reference has been cited as teaching that it is well known to weigh some colors more than others in color correction devices. The Yamaguchi reference does not teach or suggest a color correction device in which a color correction matrix is adjusted "according to at least three primary colors, gray scale elements, and at least two additional non-primary colors." Claim 6 and its dependent claims 7-9, 11-12, and 17-18 are submitted as patentable over the proposed combination of the Kim and Yamaguchi references.

Claim 13 recites a method of correcting an image from an image sensor. The method includes "dividing the image sensor into a plurality of pixels," "placing color separators over said plurality of pixels, such that each pixel receives incoming light that is filtered to emphasize one color component," and "obtaining a color correction matrix for said pixels, said color correction matrix being one which takes into account correction of incoming radiation for at least three primary colors, gray scale elements, and two other non-primary colors." Respective error measures for *gray scale elements* and non-primary colors "are weighted such that said correction matrix corrects for some of said gray scale elements and non-primary colors more than said primary colors." Each error measure represents "a difference between a reference output for a known reference color from a color image array and what would be expected for each of said reference outputs."

The reference to Kim teaches a color correction method in which gray level (achromatic) correction and color (chromatic) correction are performed separately. Gray level data collected with a densitometer is stored in a database separate from that for the color correction matrix data. The Kim reference does not teach or suggest "obtaining a color correction matrix for said pixels, said color correction matrix being one which takes into account correction of incoming radiation for at least three primary colors, gray scale elements, and two other non-primary colors." Claim 13 is not obvious over the cited reference to Kim.

The Yamaguchi reference does not cure the deficiencies of the Kim reference. The reference to Yamaguchi has been cited as teaching that it is well known to weigh some colors more than others. The Yamaguchi reference does not teach or suggest a

color correction method which includes "obtaining a color correction matrix for said pixels, said color correction matrix being one which takes into account correction of incoming radiation for at least three primary colors, gray scale elements, and two other non-primary colors." Claim 13 is submitted as patentable over the proposed combination of the references to Kim and Yamaguchi.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Applicant notes that a copy of U.S. Pat. No. 6,542,185 to Bogardus was enclosed with the Office Action mailed January 30, 2004, and was listed on the Form PTO-892 accompanying the Office Action but a discussion of Bogardus is absent. Instead, paragraph 17 of the Office Action repeats the discussion of U.S. Pat. No. 6,256,062 to Endo from the previous Action.

Dated: April 1, 2004

Respectfully submitted,

By_____

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